



State of Nevada – Department Of Personnel

CLASS SPECIFICATION

<u>TITLE</u>	<u>GRADE</u>	<u>EEO-4</u>	<u>CODE</u>
REGISTERED PROFESSIONAL ENGINEER	44*	B	6.101
OPTION A: COLORADO RIVER COMMISSION			
B: PUBLIC WORKS BOARD			
C: HIGHWAY PROJECT MANAGER			

Under general direction, incumbents perform professional engineering work in coordinating, planning, directing and managing activities as a project engineer within the Colorado River Commission of Nevada, the Public Works Board or the Department of Transportation; develop, design, negotiate, review and modify contracts, agreements, engineering plans and specifications, and engineering schedules. Work requires accurate analysis of complex situations and adaptation of effective courses of action.

Registered professional engineers within the specified options perform engineering functions that require analysis involving the application of advanced principles and abstract concepts in the development of unique solutions to difficult problems that impact the administration and management of major, broad organizational services and long and short range goals. Activities consist of duties that result in decisions and provide control of outcome of decisions. Incumbents deal with executives, officials and regulatory representatives for the purpose of negotiating solutions to major issues involving the influence of policy and procedure changes.

OPTION A: Colorado River Commission: Perform engineering project planning functions that involve preparing engineering design criteria and preliminary cost estimates for specific projects by reference to criteria and specifications for similar work and coordinating with others involved with project construction; preparing scope of work and engineering service agreements for professional engineering services to assist in the design and construction of water works projects by coordinating with those that will be using the project to assure that all needed items are included and that costs are kept to a minimum; preparing request for proposals and evaluation criteria for professional engineering services and, as a member of a review panel, participating in the evaluation and selection process; preparing scope of work for professional engineering service contracts; preparing construction contract provisions and specifications for general use for future projects; and coordinating project planning and design with local, State and federal agencies to ensure that all agencies' views are incorporated and all applicable rules and regulations are met.

Administer engineering project construction, services and contractual agreements by attending meetings held by the contractor and the engineering consultant to ensure that all items of work that may become a problem are known and the status as to costs by both parties is current; reviewing and making changes or recommending changes to draft construction contract documents including the bid form, agreement, general provision and specifications by closely observing the work in progress and conducting engineering progress meetings; monitoring construction schedules and field work to assure conformance with the contract plans and specifications; coordinating project construction activities with local, State and federal agencies so all agencies are kept informed of progress and potential problems for their input and possible solutions. Provide for the planning and management of water resources to safeguard Nevada's apportionment of Colorado River water to include preparing engineering and economic studies by researching, communicating with others and developing mathematical programs for the management of the Colorado River water resources; assisting the Chief Engineer by preparing agenda items for technical and semi-technical meetings at the local, State, interstate and federal government levels; and reviewing and preparing responses to reports that address Colorado River water issues to assure that Nevada's water resource interests are not diminished.

***Reflects a 2-grade, special salary adjustment authorized by the 2001 Legislature to improve recruitment and retention.**

OPTION A: Colorado River Commission (cont'd)

Perform office engineering functions and provide technical and administrative support to include reviewing and preparing property descriptions by calculating land traverses so easements and rights of way across land administered by the Colorado River Commission can be sold to utilities and others wanting access.

May supervise staff to include assigning and prioritizing tasks, reviewing work and performing evaluations of work performance.

OPTION B: Public Works Board: Engineers in the Public Works Board serve as project engineers within the specific engineering discipline of either mechanical, electrical, structural or civil engineering for Public Works Board construction and capital improvement projects.

Provide project management which involves preparing assigned project budgets and descriptions for biennial Capital Improvement Projects for the State Legislature; participating in architect/engineer selections for selected projects by evaluating written proposals and conducting oral interviews; negotiating architect/engineer design contracts with selected firms by establishing a scope of work and negotiating an appropriate design fee for services; managing projects during the design phase by performing regular design reviews with architectural/engineering team and the using agency; coordinating efforts to achieve project goals; maintaining project budget and approving all expenditures; preparing materials for bid package and advertising projects for bids; opening bids and negotiating construction contracts; managing projects during construction; performing intermediate and final project inspections; and issuing a final Notice of Completion.

Provide engineering design services in the specific engineering discipline to include all phases of design work which involves preparing sketches and details; supervising drafting and checking drawings as required to produce final construction drawings; preparing written technical specifications; preparing calculations as required to substantiate designs; preparing preliminary and detailed final cost estimates of either civil, structural, electrical or mechanical components of the projects; and performing construction administration services to include approving shop drawings and/or submittals and conducting on-site inspections during construction.

Prepare cost estimates for State Public Works Board capital improvement projects to include preparing a preliminary design outline to determine materials and labor requirements; preparing cost estimates for State agencies for their use in planning agency budgets and projects and writing comprehensive reports justifying cost estimates.

Provide engineering expertise to other staff members as it relates to their projects, or to other State agencies as requested.

Within a specific engineering discipline, duties may include:

Investigate operational problems caused by malfunctions of mechanical equipment such as heating and air conditioning systems to determine if problems are equipment or design related and prepare detailed reports of investigations to include corrective action, recommendations and cost estimates.

Assess hazardous materials and provide management of hazardous materials abatement projects to include assessing asbestos containing materials in existing buildings to allow for removal and/or abatement of asbestos as required to facilitate remodel, renovation or demolition projects; preparing plans and specifications for asbestos removal projects and ensuring that all removal projects are performed in accordance with the plans and specifications; conducting surveys and collecting samples of suspect building materials for laboratory analysis; and performing project management duties for all major asbestos abatement projects.

OPTION B: Public Works Board (cont'd)

Administer structural plan checking program for capital improvement projects, agency projects, and schools by contracting outside structural responses, and coordinating with architects and engineers to ensure that plan comments are incorporated into the final designs; perform in-house plan checking for capital improvement projects, agency projects and schools which involves a comprehensive technical review of construction documents prior to bidding; and provide Uniform Building Code interpretations to architects and engineers.

Perform investigations to determine cause of maintenance problems; evaluate and estimate the extent of the problem and recommend solutions.

Provide coordination of projects to include scheduling material testing services; coordinating utility application submittals of architectural/engineering firms; and coordinating with the Division of State Lands to ensure that the architectural/engineering firm has verified that the location of the structure or project is on State lands.

Provide technical and code-related advice to other agencies or government entities to ensure their projects meet minimum applicable codes and standards; provide designs of electrical, mechanical, civil or structural systems to other agencies; and provide project information to management regarding selected project parameters.

OPTION C: Highway Project Manager: Highway Project Managers are responsible for the project scope, budget and schedule for multi-million dollar highway construction projects and are accountable for all aspects of the project(s) to which assigned. Incumbents are expected to work independently within the framework of department policies and all applicable laws, regulations and statutory requirements. Project management responsibility includes determining work priorities, standards, techniques and guidelines. When standards and techniques are not adequate or applicable, judgment and ingenuity must be exercised.

Highway Project Managers are distinguished from lower level highway construction project managers by the greater complexity of projects to which assigned. Examples of projects managed at this level include the U.S. 395 Carson City Bypass, the U.S. 93 Hoover Dam Bypass, and the U.S. 93 Boulder City Bypass projects. Highway Project Managers must coordinate activities between consultants, contractors, various functional divisions within the Nevada Department of Transportation (NDOT), other State and federal agencies, and local transportation officials. Work performed requires resolution of extensive environmental, right-of-way, hydraulic, safety, and construction materials issues associated with the largest highway projects as well as intensive coordination and communication with federal officials to ensure appropriate use of federal funds.

Prepare the project scope of work and approve changes when necessary including the project description and all design requirements; meet with federal and local officials and participate in public hearings to ensure the project scope meets all necessary requirements; ensure the project is properly programmed into the State Transportation Improvement Program (STIP); continually identify major right-of-way and design options and bring them to senior management for timely decisions; and prepare and submit necessary design exceptions to the Federal Highway Administration.

Consult with various NDOT divisions to develop a realistic project schedule; consider schedules for each aspect of the project including initial studies, environmental studies, and right-of-way acquisition; ensure the project schedule is maintained and problems are resolved expeditiously; conduct periodic meetings involving various participants to review project status and identify issues to avoid project delays, and alert senior management to issues which will cause unanticipated delays; consider the availability of agency construction inspectors and need for consultant inspection.

Develop and periodically review the project budget and, if necessary, justify and make changes to the budget; work with the department's program development and financial management sections to ensure funding is available in the appropriate category for the applicable fiscal year and that no funding is lost; review past

OPTION C: Highway Project Manager (cont'd)

projects to develop accurate cost estimating factors; review all major design elements in order to identify more cost effective options; ensure the "Engineer's Estimate" is properly prepared and that all other cost elements are accurately estimated and included within the project budget; work with the Legal Division to negotiate and execute funding and other agreements with other agencies and private developers; and prepare discretionary funding requests for submission to the federal government.

Direct and manage projects during the pre-construction phase by coordinating the efforts of all functional engineering divisions and consultants; ensure all environmental, hydraulic, and right-of-way issues are addressed; determine the need for and supervise the use of outside consultants by preparing requests for proposal, conducting the consultant selection process, negotiating consultant contracts and fees, setting delivery schedules, approving payments, and conducting regular quality reviews of completed work; conduct regular project meetings and work with the many functional engineering divisions within NDOT to prepare construction plans and specifications; ensure continual coordination with all involved federal, State and local agencies including the preparation of submittals; within area of engineering expertise, perform plan reviews and make suggestions for design improvements including providing sketches, details and specifications; work with the Materials Division to identify material requirements and sources; work with the Right-of-Way and Legal Divisions to ensure that all right-of-way requirements are met in a timely manner; arrange for final plan checks to ensure design requirements are met; and resolve problems to ensure that projects stay within scope, under budget, and on schedule.

Attend pre-bid conferences, ensuring amendments to bid documents are issued, and assist in evaluating the bids; conduct periodic project inspections; coordinate with the resident engineer to ensure the project is built in accordance with the construction plan; ensure change orders are formulated and processed in a timely manner; assist in negotiating contract change orders; closely monitor traffic control to reduce delays; work to ensure affected residents, businesses and the general public are kept apprised of project impacts; at the end of a project, evaluate successes and failures and make recommendations for improvements in the development and design of future projects.

MINIMUM QUALIFICATIONS

SPECIAL NOTES AND REQUIREMENTS:

- * Registration as a professional engineer in Nevada is required at the time of appointment. Any person registered as a Professional Engineer in another state must become registered as a Professional Engineer in Nevada within six months following the date of appointment as a condition of employment.

OPTION A - COLORADO RIVER COMMISSION

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in civil engineering or a closely related field and four years of professional engineering experience in the area of utility and water resource development, design and contract preparation. Two years of the required experience must have been in a supervisory or responsible project charge capacity; **OR** an equivalent combination of education and experience in which the applicant has demonstrated possession of the entry level knowledge, skills and abilities. (*See Special Notes and Requirements*)

OPTION B - PUBLIC WORKS BOARD

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in civil, electrical, mechanical, or structural engineering and four years of professional engineering experience in

MINIMUM QUALIFICATIONS (cont'd)

OPTION B - PUBLIC WORKS BOARD (cont'd)

EDUCATION AND EXPERIENCE (cont'd)

construction and contract project management. Two years of the required experience must have been in a supervisory or responsible project charge capacity; **OR** an equivalent combination of education and experience in which the applicant has demonstrated possession of the entry level knowledge, skills and abilities. *(See Special Notes and Requirements)*

OPTION C - HIGHWAY PROJECT MANAGER

EDUCATION AND EXPERIENCE: Bachelor's degree from an accredited college or university in engineering and four years of professional engineering experience in designing, constructing or coordinating major highway or transportation projects. Two years of the required experience must have been in a supervisory or responsible project charge capacity; **OR** an equivalent combination of education and experience. *(See Special Notes and Requirements)*

ENTRY KNOWLEDGE, SKILLS AND ABILITIES (required at time of application):

ALL OPTIONS

Knowledge of: basic economic methods, including time-value-of-money concepts and life-cycle costs; basic statistical methods such as mean, standard deviation, trend analysis and curve fitting; calculus and differential equations. **Skill in:** written and oral communication to prepare written correspondence and reports and to present ideas effectively in a professional manner. **Ability to:** prepare and administer professional services agreements; work independently and follow through on assignments; organize material and information systematically to optimize efficiency; prepare engineering sketches and details suitable for drafting; modify and/or adapt engineering designs, procedures or methods to fit a given set of circumstances; read and understand technical engineering documents; speak on a one-to-one basis to obtain information, explain policies, or to persuade others to adopt a specific opinion or action; motivate others and stimulate people to effective action; negotiate, exchange ideas, information and opinions with others to formulate policies and/or arrive jointly at decisions, conclusions or solutions; mediate between contending parties or groups; read and interpret construction drawings and specifications and to prepare contract specifications; analyze information, problems, situations, practices and procedures to define a problem or objective, identify relevant concerns, formulate logical conclusions, and recognize alternatives and their implications; take action where answers to a problem are not readily available; perform on-site construction inspections and evaluations.

COLORADO RIVER COMMISSION

Knowledge of: civil engineering practices and techniques with emphasis on water resource engineering; civil engineering principles related to utility and water resource development; technical library and where reference material can be found in researching information; computer modeling techniques as applied to water resources management.

PUBLIC WORKS BOARD

Structural engineering discipline - Detailed knowledge of: structural analysis and design in timber, masonry, concrete and steel; the Uniform Building Code as it relates to structural design. **Ability to:** write technical specifications related to structural components of building; read and correct rebar, steel and wood shop drawings.

Mechanical engineering discipline - Working knowledge of: mechanical engineering practices including preparation of detailed plans and specifications for building mechanical systems to include heating, ventilating, air conditioning, plumbing, and fire protection systems. **General knowledge of:** mechanical engineering practices including heating, ventilating, air conditioning, plumbing, and fire protection systems for buildings.

MINIMUM QUALIFICATIONS (cont'd)

ENTRY KNOWLEDGE, SKILLS AND ABILITIES (cont'd)

PUBLIC WORKS BOARD (cont'd)

Civil engineering discipline - Working knowledge of: civil engineering practices, designs and specifications including water systems, land development procedures, sewage disposal, pavement, drainage grading, erosion control, site plans for evaluations, calculations, determination needs, selection of services and designs to support capital improvement projects and communicate with architectural and engineering firms and consultants and relay information to different levels of management and co-workers. **General knowledge of:** civil engineering practices including traffic, transportation, water resources, testing, environmental protection, and surveying.

Electrical engineering discipline - Knowledge of: the principles of electrical engineering; techniques and materials used in electrical construction; principles of electronics, electromagnetics, and the practices and materials of current electronic and communications technologies; Fourier analysis, including development of spectra of arbitrary repetitive waveforms. **Ability to:** produce satisfactory and code-compliant designs for electrical systems for both generation and distribution of electrical energy in buildings and on facilities, including the utilization of that energy by fixed, stationary, and portable devices, and to evaluate designs of others for such systems for adequacy and compliance with applicable codes, laws and standards; produce satisfactory and code-compliant designs for lighting systems, fire alarms, security and communications; compare the progress of construction of electronic systems with published designs and to develop satisfactory and code-compliant solutions to problems; engage in spectra analysis or figure harmonic spectrum resulting from a waveform.

HIGHWAY PROJECT MANAGER

Detailed knowledge of: current engineering principles and practices related to highway and bridge design and construction; project management techniques as related to the scope, budget and schedule; design and pre-construction phases of a major project. **Working knowledge of:** environmental, right-of-way, hydraulic, safety, and construction materials issues associated with major highway construction projects; federal, State and local government agencies involved in highway construction projects; budget development and control. **Ability to:** coordinate major activities across divisional and functional areas within NDOT; monitor the work of consultants and contractors to ensure project completion within the allotted budget and time frames; arrange for final plan checks and make necessary changes; oversee project construction and process or approve change orders as required; prepare and submit documentation and reports to all applicable agencies and entities; work cooperatively with professional staff and management within the department and with external organizations involved in assigned projects; develop and manage budgets for multi-million dollar highway construction projects.

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (typically acquired on the job):

ALL OPTIONS

Knowledge of: construction contracts dealing with technical subjects including the interpretation of complicated plans and specifications. **Ability to:** discuss a variety of job-related topics on short or no notice; operate personal computer to perform complex engineering and mathematical calculations and present information in a clear and concise format; coordinate activities dealing with starting, scheduling, and constructing projects which involve consultants, contractors and other agencies and mediate differences; analyze complex technical data and formulate logical and objective conclusions so information can be displayed in a clear, understandable format; to prioritize assignments to complete work in a timely manner even with competing requirements and pressures of deadlines; present a variety of technical material to groups effectively on short notice.

MINIMUM QUALIFICATIONS (cont'd)

FULL PERFORMANCE KNOWLEDGE, SKILLS AND ABILITIES (cont'd)

COLORADO RIVER COMMISSION

Knowledge of: "Law of the River" comprised of compacts and federal laws, and Nevada Revised Statutes related to responsibilities of the Colorado River Commission; procedures and policies established by the Commission. **Ability to:** compose data and write technical reports of suitable quality for publication; write contracts to include all pertinent and necessary provisions to provide needed control of the water resource and protect the Colorado River Commission and the State from lawsuits or damages; train and supervise personnel.

PUBLIC WORKS BOARD

Structural engineering discipline - Knowledge of: the value of constructed components and building systems necessary for cost estimating and evaluation of construction change orders. **Ability to:** perform detailed cost estimates for structural components of buildings; apply code requirements to real life situations.

Mechanical engineering discipline - Knowledge of: State regulations and Public Works Board standards and procedures relating to the state building construction program; mechanical and plumbing systems. **Ability to:** perform detailed cost estimates for mechanical and plumbing components; design mechanical and plumbing systems.

Civil engineering discipline - General knowledge of: various federal and state governmental regulation agencies to see if a particular capital improvement project is in compliance; building and site construction practices to judge what information is pertinent and in compliance. **Ability to:** design and estimate cost for civil facilities.

Electrical engineering discipline - Knowledge of: specialized pieces of equipment, of special requirements these have for tele/data communications systems, lighting, power, air-handling, fire protection, accessibility, and clearance, and for special requirements for containment of leaking fluids. **Ability to:** design and estimate cost for electrical facilities.

HIGHWAY PROJECT MANAGER

Working knowledge of: negotiation and administration of contracts; design and construction of major highway projects; agency policies and procedures; State and federal contracting and budgeting processes. **Ability to:** plan, organize, coordinate and manage all phases of major highway construction projects including developing the scope of work, project schedules and budgets, and coordinating the pre-construction engineering and construction activities.

This class specification is used for classification, recruitment and examination purposes. It is not to be considered a substitute for work performance standards for positions assigned to this class.

6.101

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